Fixed Point

∗ The user should guarantee first that the function f(X) is continuous on the interval and that the function g(X) is smooth and continuous on the interval [A,B] where the function is so that the method can function properly

1) Ask the user for the function f(X), and another function g(X) along with the tolerance.
2) Ask the user for the value X_0 , which will be the initial value.
3) We evaluate X_0 in the function to obtain $f(X_0)$. If $f(X_0) = 0$ then tell the user that this is the root.
4) Now we find the following value of X, we will store it in the variable X_n and continue evaluating X_0 in g(X). like this we have $X_n = g(X_0)$. And we evaluate it in the function f(X)… if $f(X_n) = 0$ then we tell the use that this is the root.
5) We find the error with error $= | X_0 – X_n |$
6) Now we do a cycle … while the error $>$ tolerance, $f(X_n) \neq 0$, do :
   a) $X_0 = X_n$
   b) $X_n = g(X_n)$ to say X_n evulated in the function g.
   c) Error $= | X_0 – X_n |$
   d) $f(X_n) =$ the new value of X_n evaluated in the function f
7) If the error $\leq$ tolerance, tell the user that the root is approximately X_n (final value) with the error being: _____(with the final value of the error)
8) If $f(X_n) = 0$ tell the user that X_n is the root.